What is Claimed is:

[c1] 1.A method for calculating duration of a representative cardiac cycle using ECG waveform data, the method comprising:
generating the ECG waveform data using an electrocardiogram device;
evaluating said ECG data to validate a signal from said electrocardiogram device;
detecting QRS complexes of ECG data using a detection function;
analyzing underlying cardiac rhythm based on said detected QRS complexes;
selecting an even number N of substantially normally shaped consecutive QRS complexes;
computing an RR interval between said consecutive QRS complexes to yield N-1 intervals;
calculating duration of the representative cardiac cycle by averaging at least a plurality of said N-1 intervals.

[c2] 2.The method of claim 1, wherein said selecting an even number N of substantially normally shaped consecutive QRS complexes includes $N \geq 8$.

[c3] 3.The method of claim 1, wherein said validating said signal from said electrocardiogram device includes evaluating for at least one of noise, baseline stability, artifacts, including combinations of at least one of the foregoing.

[c4] 4.The method of claim 1, wherein said analyzing underlying cardiac rhythm includes determination of a suitable heart rate.

[c5] 5.The method of claim 1, wherein said calculating duration of the representative cardiac cycle by averaging includes averaging by one of a mean method and a median method.

[c6] 6.The method of claim 5, wherein said mean method comprises:
discarding at least one of a longest and a shortest interval of said N-1 intervals; and
computing a mean of a remaining N-1 intervals indicative of the representative cardiac cycle so as to associate with a computed tomography imaging system scan.

[c7] 7.The method of claim 6, wherein said discarding includes discarding said N-1 intervals $\geq$ 1 second.

[c8] 8.The method of claim 5, wherein said median method comprises:
arranging said N-1 intervals in ascending order; and
selecting a middle interval of said N-1 intervals in ascending order, said middle interval indicative of the representative cardiac cycle so as to associate with a computed tomography imaging system scan.

[c9] 9.The method of claim 1, wherein said selecting an even number N of substantially normally shaped consecutive QRS complexes includes selecting N+L consecutive QRS complexes if abnormally shaped QRS complexes are present, where L $\geq$ 2 and N+L is an even number.

[c10] 10.A medium encoded with a machine-readable computer program code for associating ECG waveform data with medical imaging data using a data synchronization scheme, said medium including instructions for causing a controller to implement a method comprising:
generating the ECG waveform data using an electrocardiogram device;
evaluating said ECG data to validate a signal from said electrocardiogram device;
detecting QRS complexes of ECG data using a detection function;
analyzing underlying cardiac rhythm based on said detected QRS complexes;
selecting an even number N of substantially normally shaped consecutive QRS complexes;
computing an RR interval between said consecutive QRS complexes to yield N-1 intervals;
calculating duration of the representative cardiac cycle by averaging at least a plurality of said N-1 intervals.

[c11] 11.The medium of claim 10, wherein said selecting an even number N of substantially normally shaped consecutive QRS complexes includes N $\geq$ 8.

[c12] 12.The medium of claim 11, wherein said validating said signal from said electrocardiogram device includes evaluating for at least one of noise, baseline

stability, artifacts, including combinations of at least one of the foregoing.

[c13] 13.The medium of claim 11, wherein said analyzing underlying cardiac rhythm includes determination of a suitable heart rate.

[c14] 14.The medium of claim 11, wherein said calculating duration of the representative cardiac cycle by averaging includes averaging by one of a mean method and a median method.

[c15] 15.The medium of claim 14, wherein said mean method comprises:
discarding at least one of a longest and a shortest interval of said N-1 intervals; and
computing a mean of a remaining N-1 intervals indicative of the representative cardiac cycle so as to associate with a computed tomography imaging system scan.

[c16] 16.The medium of claim 15, wherein said discarding includes discarding said N-1 intervals $\geq$ 1 second.

[c17] 17.The medium of claim 14, wherein said median method comprises:
arranging said N-1 intervals in ascending order; and
selecting a middle interval of said N-1 intervals in ascending order, said middle interval indicative of the representative cardiac cycle so as to associate with a computed tomography imaging system scan.

[c18] 18.The medium of claim 10, wherein said selecting an even number N of substantially normally shaped consecutive QRS complexes includes selecting N+L consecutive QRS complexes if abnormally shaped QRS complexes are present, where L $\geq$ 2 and N+L is an even number.

[c19] 19.A method for associating ECG waveform data with image data generated by an imaging system using a data synchronization scheme comprising:
obtaining the imaging system, an electrocardiogram device and an object to be examined;
associating said object with the imaging system and said electrocardiogram device; and

processing the image data and the ECG waveform data using the data synchronization scheme wherein the data synchronization scheme,
generates the ECG waveform data using an electrocardiogram device;
evaluates said ECG data to validate a signal from said electrocardiogram device;
detects QRS complexes of ECG data using a detection function;
analyzes underlying cardiac rhythm based on said detected QRS complexes;
selects an even number N of substantially normally shaped consecutive QRS complexes;
computes an RR interval between said consecutive QRS complexes to yield N-1 intervals; and
calculates duration of the representative cardiac cycle by averaging at least a plurality of said N-1 intervals.

[c20] 20.A system for associating ECG waveform data with image data using a data synchronization scheme comprising:
an imaging system;
an object disposed so as to be communicated with said imaging system, wherein said imaging system generates image data responsive to said object; and
a processing device having the data synchronization scheme, wherein the data synchronization scheme,
generates the ECG waveform data using an electrocardiogram device;
evaluates said ECG data to validate a signal from said electrocardiogram device;
detects QRS complexes of ECG data using a detection function;
analyzes underlying cardiac rhythm based on said detected QRS complexes;
selects an even number N of substantially normally shaped consecutive QRS complexes;
computes an RR interval between said consecutive QRS complexes to yield N-1 intervals; and
calculates duration of the representative cardiac cycle by averaging at least a plurality of said N-1 intervals.

[c21] 21.The system of claim 20, wherein said object is a patient.

[c22] 22.The system of claim 21, wherein said imaging system is a computed tomography imaging system.

[c23] 23.A method to improve cardiac image quality in the presence of arrhythmias during medical imaging with a scanning medical imaging system, the method comprising:
calculating a representative R-R interval of a patient;
selecting a scanning window within said representative R-R interval;
scanning a patient's heart during said scanning window to obtain image data;
detecting an arrhythmia at one of prior and during said scanning window; and
assembling an image of the patient's heart representative of said scanning window of said R-R interval from chronologically discontinuous segments of the image data while rejecting any image data corresponding to any R-R interval of plurality of R-R intervals having said arrhythmia.

[c24] 24.The method in accordance with Claim 23 wherein scanning said patient's heart comprises axially scanning the patient's heart.

[c25] 25.The method in accordance with Claim 24 wherein said patient is supported on a moveable table, said axially scanning said patient's heart is repeated a plurality of times and said assembling said image of said patient's heart is repeated for each said axially scanning the patient's heart, and further comprising indexing said table between said axially scanning said patient's heart unless said arrhythmia is detected.

[c26] 26.The method in accordance with Claim 25 wherein power is turned on for said scanning during said scanning window after a delay from a start of said R-R interval.

[c27] 27.The method in accordance with Claim 26 wherein said power is turned off to prevent said scanning when said arrhythmia is detected during one of said delay and said scanning window.

[c28] 28.The method in accordance with Claim 27 wherein any image data obtained during said scanning window when said arrhythmia is detected is flagged for nonuse in image reconstruction.

[c29] 29.The method in accordance with Claim 28 wherein said table is one of not indexed and adjusted upon detection of said arrhythmia.

[c30] 30.The method in accordance with Claim 29, wherein in a contiguous succeeding R-R interval and after a second delay from said arrhythmia detected as a premature atrial beat (PAB), power to the imaging system is turned on during a second scanning window and an acquired image therefrom is flagged for use in said image reconstruction.

[c31] 31.A scanning computed tomography (CT) imaging system for imaging a heart, said system configured to:
compute a representative R-R interval of a patient using an ECG signal;
scan said patient's heart a plurality of times during a selected scanning window of said R-R interval to obtain image data;
detect an arrhythmia at one of prior and during said scanning window;
reject any image data corresponding to any R-R interval having said arrhythmia; and
assemble an image of said patient's heart representative of said selected scanning window of the cardiac cycle from chronologically discontinuous segments of the image data.

[c32] 32.The system in accordance with Claim 31 further configured to axially scan the patient's heart.

[c33] 33.The system in accordance with Claim 32 further comprising a moveable table configured to support the patient, and wherein said system is further configured to perform a plurality of axial scans of the patient's heart, to assemble an image of the patient's heart for each of said plural axial scans, and to index said table between each of said axial scans unless said arrhythmia is detected.

[c34] 34.The system in accordance with Claim 33 further configured to turn power on for scanning during said scanning window after a delay from a start of said R-R interval.

[c35] 35.The system in accordance with Claim 34 further configured to turn power off to prevent scanning during said scanning window when said arrhythmia is

detected when said arrhythmia is detected.

[c36] 36.The system in accordance with Claim 35 further configured to turn power on in a second scanning window in a succeeding contiguous R-R interval to said R-R interval and after a second delay from said arrhythmia detected as a premature atrial beat (PAB), wherein image data acquired from said second scanning window is flagged for use in said image reconstruction.